**Program of classes, seminars, lectures**

WINTER SEMESTER:

**Basic of Medicine A- musculoskeletal system 27h (4W + 8S + 15C)**

**Lectures:** ( e-lectures on the Teams)

1. (2h) Connective tissue - structure and functions, types of connective tissue: proper connective tissue, resistance connective tissues: cartilage tissue, bone tissue.

2. (2h) Muscle tissue - structure and types. Skeletal muscle structure. Connections between muscles and bones.

**Seminars:**

Seminar 1: 2h

General embryology part I: Male sex cell - sperm. Spermatogenesis. Spermiogenesis. Sperm. Female sex cell - egg. Oogenesis. Vitellogenesis. Insemination and fertilization. Cleaving and implantation

Seminar 2: 2 h

General embryology part II: Gastrulation. The embryonic disc - its development and transformation. Development and structure of the placenta. Development mechanics and developmental periods of the embryo. Pharyngeal clefts, arches and pockets.

Seminar 3: 2 h

General embryology part III: Differentiation of the embryo and the fetus. Formation of primary organs. The formation of secondary organs. Structure, cytophysiology and topography of human fetal organs. Environmental influences and birth defects. Multiple pregnancy.

Seminar 4: 2 h:

Intercellular junctions, adhesive molecules.

**Laboratory classes:**

Class 1: 3h

Regulations and operation of the microscope.

Research methods used in histology. Cell membrane. Kernel. The nucleus. Cytoplasm. Endoplasmic reticulum. Cell center. Mitochondria. Golgi apparatus. Lysosomes. Neurofibrils. Tonofibrils. Myofibrils. Cytoplasmic inclusions (glycogen, pigment, lipids. Biogenesis of cell organelles.

Class 2: 3h

Proper connective tissue: cells, fibers, basic substance. Proper connective tissues: gelatinous, dense fibrous connective tissue, regular and irregular.

Connective resistance tissues part. 1. vitreous, elastic and fibrous cartilage. Chondrogenesis. Cartilage cells. The intercellular substance of the godfather tissue. Growth cartilage.

Class 3: 3h

Connective resistance tissues part. 2: bone tissue. The intercellular substance of bone tissue, cells of bone tissue, types of bone tissue: plexus, lamellar, spongy, compact bone tissue. Bone development, ossification on mesenchymal and cartilage basis.

Class 4: 3h

Muscle: smooth, transversely striated skeletal and cardiac. Fibers of the atrioventricular system of the heart. The ultrastructure of the sarcomere. Myogenesis.

Class 5: 3h

Practical test. Theoretical test.

**Basic of Medicine B-nervous system 25h (4W + 6S + 15C)**

**Lectures:** (e-lectures on the Teams)

1. (2h) Epithelial tissue. Nerve tissue.

2. (2h) Skin. The organ of sight and hearing.

**Seminars:**

Seminar 1: 2h

The processes of conduction, excitation and signal transmission in the nervous system. Construction of a synapse. Higher nervous activities

Seminar 2: 2h

Skin sensation, touch bodies, free nerve endings. The processes of receiving and transmitting the stimuli of taste, sight, hearing and touch.

Hearing and balance. Corti's spiral organ.

Seminar 3: 2h

Development of the nervous system. Skin development. Development of the hearing organ

**Laboratory classes:**

Class 1: 3h

Epithelial tissue: Monolayer epithelium - flat, cubic, cylindrical. Pseudostratified epithelium. Multilayer epithelium - flat, cylindrical, transitional. Glandular tissue: mucous cells, serous cells.

Class 2: 3h

Nerve tissue: morphology and classification of neurons, nerve fibers, nerve trunk. Degeneration and regeneration of nerve fibers. Glial cells.

Class 3: 3h

Nervous system: central part: cerebral cortex, hippocampus, subcortical nuclei, cerebellar cortex, spinal cord. Peripheral part: ganglia. Development of the nervous system. Autonomous system. Eye. The development of the organ of vision.

Class 4: 3h

Skin with subcutaneous tissue. The sebaceous and sweat glands. Skin development. Skin products: glands, hair, nails. The mammary gland. Hearing organ.

Class 5: 3h

Theoretical test. Practical test.

**Basic of Medicine C- hematopoietic / immune system 19h (4W + 6S + 9Ć)**

**Lectures:** (e-lectures on the Teams)

1. (2h) Blood - as a connective tissue.

2. (2h). MALT, BALT, GALT - structure and role.

**Seminars:**

Seminar 1: 2 h

The cell cycle and its regulation. Proliferation, stages of proliferation. Cell differentiation and aging.

specific and non-specific immunity.

Seminar 2: 2 h

Types of cell death: apoptosis, necrosis, autophagy, mitotic catastrophe. The role of these processes in the functioning of the body.

Seminar 3: 2 h

Stem cells - their types and occurrence. The role, use and procurement of stem cells.

**Laboratory classes:**

Class 1: 3h

Blood: plasma, red and white cells, platelets. Blood functions. Lymph. Myeloid tissue. Hematopoiesis, myelogenesis.

Class 2: 3h

Lymphatic organs: lymphatic papules, lymph node, tonsils, spleen, thymus. Cytological processes of immunization.

Class 3: 3h

Practical test. Theoretical test.

**SPRING SEMESTER:**

**Basic of Medicine D and E - cardiovascular and respiratory system - 24h (6W + 8S + 10Ć)**

**Lectures:** (e-lectures on the Teams)

1. (2h) Blood vessels and heart.

2. (2h) Respiratory system - structure and functions.

3. (2h) Biological barriers

**Seminars:**

Seminar 1: 2 h

Development of the heart and blood vessels.

Seminar 2: 2 h

Aging of the body

Seminar 3: 2 h

Endothelial cytophysiology. Angiogenesis.

Seminar 4: 2 h

Development of the respiratory system. Congenital defects of the respiratory system and the mechanism of their formation.

**Laboratory classes:**

Class 1: 3i1/3h

Histological structure of the heart: pericardium, endocardium (heart skeleton, heart muscle), endocardium. The conductive system of the heart. Cytophysiology of cardiomyocytes and cells of the heart's conduction system.

Large caliber arteries and veins. Construction of venous valves. Vascular anastomosis.

Histological structure and types of capillaries. Endothelium.

Small and medium caliber arteries and veins. Lymphatic vessels.

Class 2: 3 and 1/3 h

General structure of the respiratory system: types of epithelium in the respiratory system, structure of the mucosa and submucosa. The occurrence and role of glandular epithelial tissue in the respiratory system. Types of cartilage tissue found in the respiratory system. The presence and function of the lymphatic system in the respiratory system.

Histological structure of the larynx.

Histological structure of the trachea.

Histological structure of the bronchi.

Histological structure of bronchioles: types of bronchiolar epithelium, Clara cells: structure and function. Differences in the histological structure of the end and respiratory bronchioles. Structure and histological organization of the lungs. Alveolar epithelium. Types, structure and role of pneumocytes. Occurrence and function of macrophages present in lung tissue. Components of the blood-air barrier. Composition and role of surfactant in alveoli.

Class 3: 3 and 1/3 h

Practical test. Theoretical test.

**Basic of Medicine F- digestive / endocrine system - 39h (11W + 8S + 20C)**

**Lectures:** (e-lectures on the Teams)

1. (2h) Oral cavity, dental organ.

2. (2h) Salivary glands

3. (2h) Digestive system - part I

4. (2) Digestive system - part II

5. (2h) Large glands in the digestive tract - liver, pancreas.

6. (1h) Endocrine system.

**Seminars**

Seminar 1: 2h

Pharyngeal organ. Development of the tooth and salivary glands. Congenital defects occurring as a result of developmental disorders of the pharyngeal organ.

Seminar 2: 2h

Development of the esophagus, stomach and intestines. Disorders that occur in the development of the esophagus, stomach and intestines.

Seminar 3: 2h

Development of the liver, pancreas, gallbladder. Disorders that occur in the development of the liver, pancreas, gallbladder.

Seminar 4: 2 h

Development of endocrine glands. Congenital defects of the endocrine glands.

**Laboratory classes:**

Class 1: 3 and 1/3 h

Mouth: Lips, tongue, tongue papillae. Tonsils. Salivary glands: parotid, submandibular and sublingual. Tooth organ: tooth pulp, enamel, dentin, cement.

Class 2: 3 and 1/3 h

The general structure of the digestive tract. Esophagus. Stomach. Esophagus and stomach glands - location and structure. Development of the esophagus.

Class 3: 3 and 1/3 h

Digestive system part II: Small intestine - duodenum, jejunum, ileum. Large intestine, appendix. The glands of the small intestine. Phenomena of secretion and resorption in the gastrointestinal tract.

Class 4: 3 and 1/3 h

Large glands of the digestive tract: Liver: hepatocytes, hepatic lobules and clusters, bile ducts. Vascularization of the liver. Histochemical reactions in the liver. Gallbladder. Pancreatic exocrine function. Clinical characteristics of pancreatic exocrine dysfunction.

Class 5: 3 and 1/3 h

Endocrine system - structure, morphological structure and function. Endocrine glands: pituitary gland, pineal gland, thyroid, parathyroid glands, adrenal glands. Endocrine cell groups: Langerhans pancreatic islets. DNES. Ultrastructure of cells secreting protein or peptide hormones, ultrastructure of cells secreting steroid hormones.

Class 6: 3 and 1/3 h

Practical test. Theoretical test.

**Basic of Medicine G- urinary and reproductive system-32h (8W + 6S + 18C)**

**Lectures:** (e-lectures on the Teams)

1. (2h) Functioning of biological membranes and their specialization.

2. (2h) Excretory system.

3. (2h) Male reproductive system.

4. (2h) Female reproductive system.

**Seminars:**

Seminar 1: 2 h

Hormonal regulation of spermatogenesis: hormones acting on the Sertoli cell. The role of Sertoli cells in the endocrine secretion of the nucleus. Hormones that act on the interstitial cells of the testicle.

Seminar 2: 2h

Regulatory mechanisms of the sexual cycle in women. Hormonal regulation of the sexual cycle. Correlation of hormone activity with the change in the morphological structure of the organs of the female reproductive system. Cytodiagnostics of vaginal smears as an indicator of hormonal and pathological changes, its diagnostic importance.

Seminar 3: 2 h

Development of the urinary system. Congenital kidney defects.

**Laboratory classes:**

Class 1: 3 and 1/3 h

Male reproductive system: Testicle (spermatogenesis, seminiferous tubules, sperm-forming epithelium, sperm, interstitial cells). Blood-sperm-forming epithelium barrier. Testicular evacuation wires. Epididymis. The vas deferens. Penis. Additional sex glands: seminal vesicles, prostate gland, bulbourethral glands

Class 2: 3 and 1/3 h

Female reproductive system: Ovary (ovogenesis: follicular developmental stages, corpus luteum, corpus luteum, cavity cells). Fallopian tube. Uterus. Vagina. Histogenesis of the female and male reproductive system. Mammary gland: development, structure of the mammary gland, pregnancy and lactation. The action of hormones on the mammary gland.

Class 3: 3 and 1/3 h

Kidney (nephron, glomerular apparatus), histochemical reactions in the kidney. A purse of a ball.

Podocytes and the filtration barrier. Endothelium and capillaries. Ureter. Bladder. Bladder muscle tissue.

Urethra.

Class 4: 3 and 1/3 h

Practical test. Theoretical test.

Class 5: 3 and 1/3 h Slides rewiev

Class 6: 1 and 1/3 h Slides rewiev, continued, Retakes.